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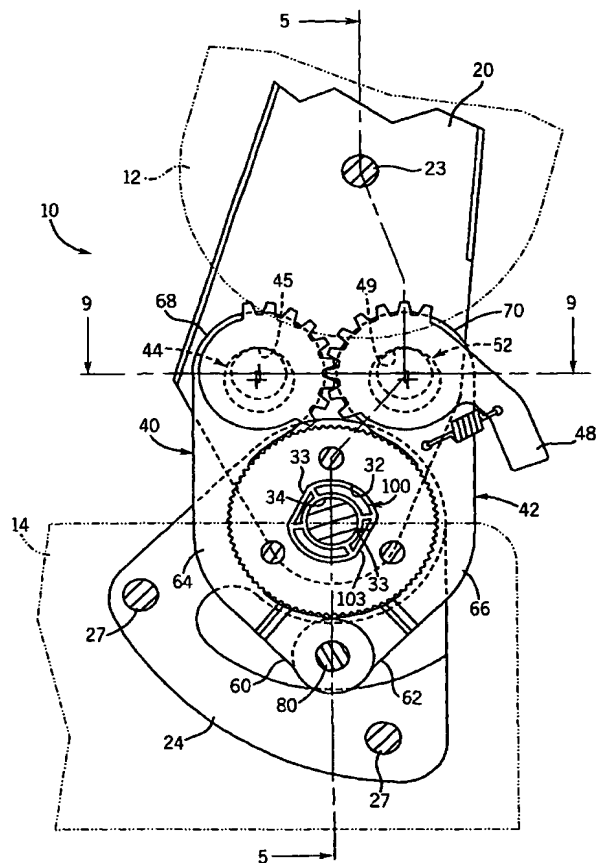
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- (71) Applicant (for all designated States except US): **JOHN-SON CONTROLS TECHNOLOGY COMPANY**
[US/US]; 650 Waverly, Holland, MI 49423 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **SEIBOLD, Kurt, A.**
[US/US]; 11896 Fair Way Drive, South Lyon, MI 48178 (US).
- (74) Agent: **LAZARUS, John, M.**; Foley & Lardner, 777 E. Wisconsin Avenue, 33rd Floor, Milwaukee, WI 53202 (US).
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[Continued on next page]

(54) Title: RECLINER MECHANISM



(57) Abstract: A recliner mechanism for a vehicle seat includes a toothed sector member secured to a seat frame and first and second pivoted pawl members each including a plurality of teeth to engage the teeth of the sector member. The first and second pawl members also each pivot on a cam pin member located at a distal end thereof, the cam pins each have a center axis and an offset axis having by a toothed cam lobe. The toothed cam lobes mesh such that rotation of one cam pin member causes the other cam pin member to rotate in the opposite direction. A handle is coupled to at least one of the cam pin members to rotate the cam pin members and cause the pawl members to rotate about a pin connecting the proximal ends of the pawl members. The pawl members are movable between a first or locked position and a second or unlocked position, permitting the seat back to be adjusted with respect to the seat base against the force of a spring.

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INTERNATIONAL SEARCH REPORT

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 035 021 A (KRUG ROBERT C) 12 July 1977 (1977-07-12) figures 1,2	1,3,6
Y	US 6 230 867 B1 (SCHWARZBICH JOERG) 15 May 2001 (2001-05-15) abstract; figure 2	1,3,6
Y	US 5 328 241 A (HAIDER SYED) 12 July 1994 (1994-07-12)	3,6
A	abstract; figure 4	1
A	DE 30 27 629 A (RENTROP HUBBERT & WAGNER) 25 February 1982 (1982-02-25) figure 3	1
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Patent family members are listed in annex.

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Pétiaud, A

INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 178 838 B1 (SCHWARZBICH JOERG) 30 January 2001 (2001-01-30) figure 1	1
A	US 4 765 680 A (KAWASHIMA HATSUO) 23 August 1988 (1988-08-23) figures 1,4,9	1
A	US 2001/037925 A1 (HOUSTON ROBERT ET AL) 8 November 2001 (2001-11-08) figure 1	1
A,P	US 2003/061899 A1 (STADLBAUER ALFRED ET AL) 3 April 2003 (2003-04-03) figure 4	1

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/31494

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4035021	A	12-07-1977	NONE
US 6230867	B1	15-05-2001	DE 29802055 U1 10-06-1999 DE 59902634 D1 17-10-2002 WO 9941101 A1 19-08-1999 EP 0979179 A1 16-02-2000 ES 2181398 T3 16-02-2003 JP 2001520605 T 30-10-2001
US 5328241	A	12-07-1994	NONE
DE 3027629	A	25-02-1982	DE 3027629 A1 25-02-1982
US 6178838	B1	30-01-2001	DE 29809418 U1 30-09-1999 DE 59906732 D1 02-10-2003 EP 0960765 A1 01-12-1999 JP 2000025496 A 25-01-2000
US 4765680	A	23-08-1988	JP 1857627 C 27-07-1994 JP 5066123 B 21-09-1993 JP 61238207 A 23-10-1986 JP 1820642 C 27-01-1994 JP 5031404 B 12-05-1993 JP 61288811 A 19-12-1986 WO 8605958 A1 23-10-1986 KR 9100309 B1 24-01-1991
US 2001037925	A1	08-11-2001	DE 10021846 A1 08-11-2001 EP 1152168 A2 07-11-2001
US 2003061899	A1	03-04-2003	US 2003062749 A1 03-04-2003 WO 03029043 A1 10-04-2003 US 2003196868 A1 23-10-2003